FIG.1

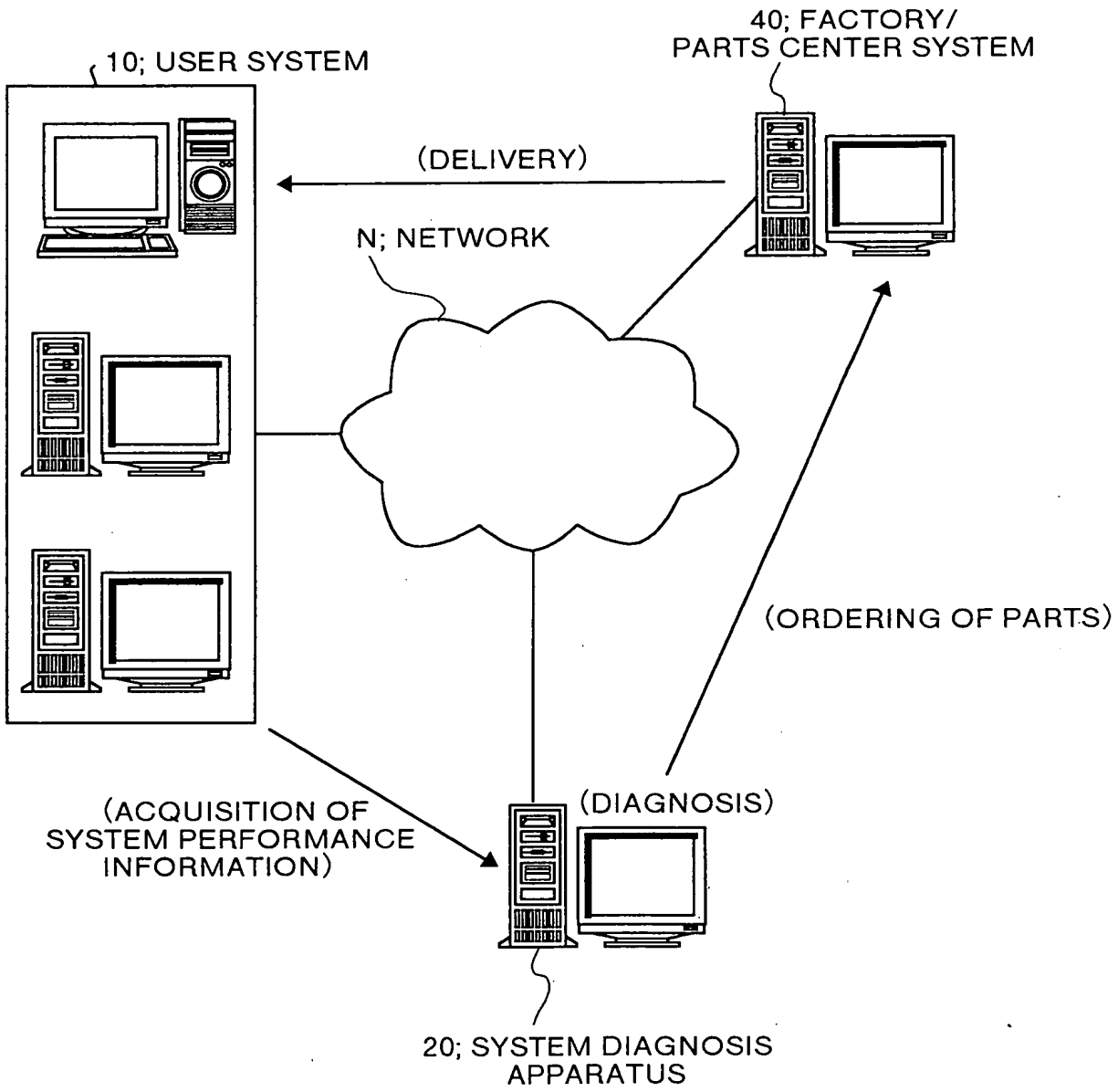

40; FACTORY/
PARTS CENTER SYSTEM
10; USER SYSTEM
(DELIVERY)
N; NETWORK
(ORDERING OF PARTS)
(ACQUISITION OF
SYSTEM PERFORMANCE
INFORMATION)
(DIAGNOSIS)
20; SYSTEM DIAGNOSIS
APPARATUS

FIG.2A

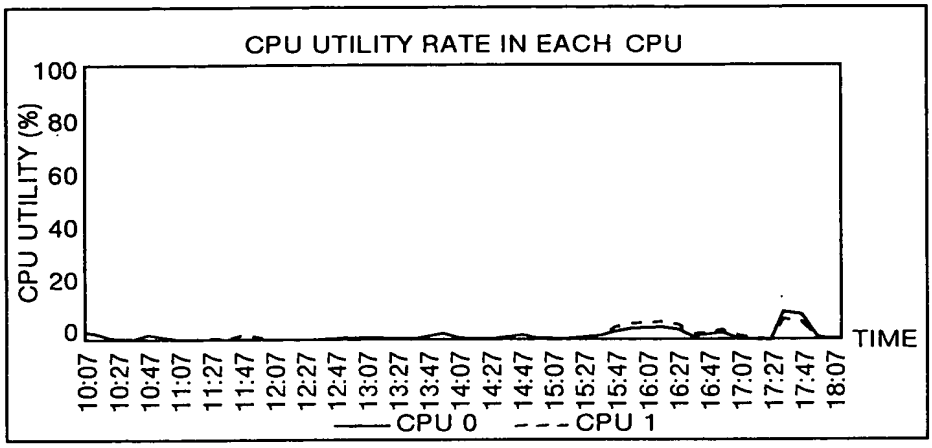



FIG.2B

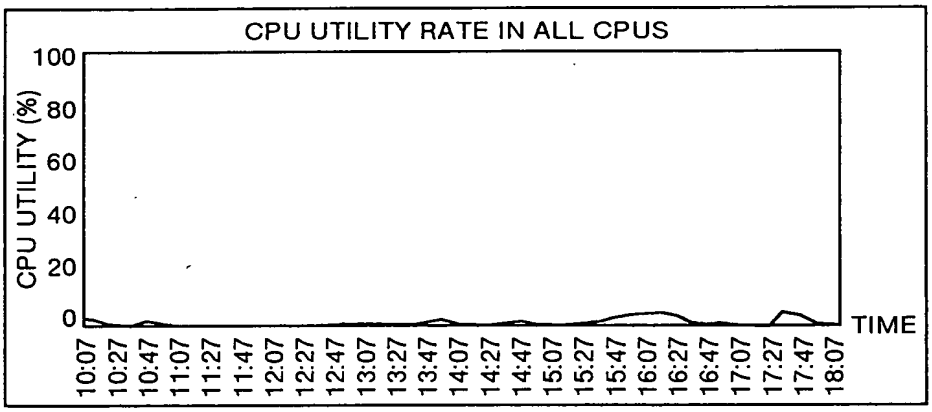



FIG.2C

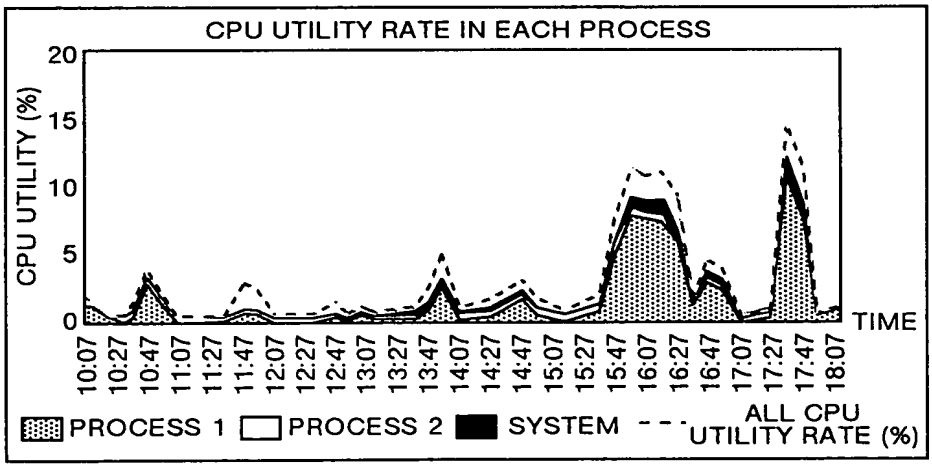


FIG.3A

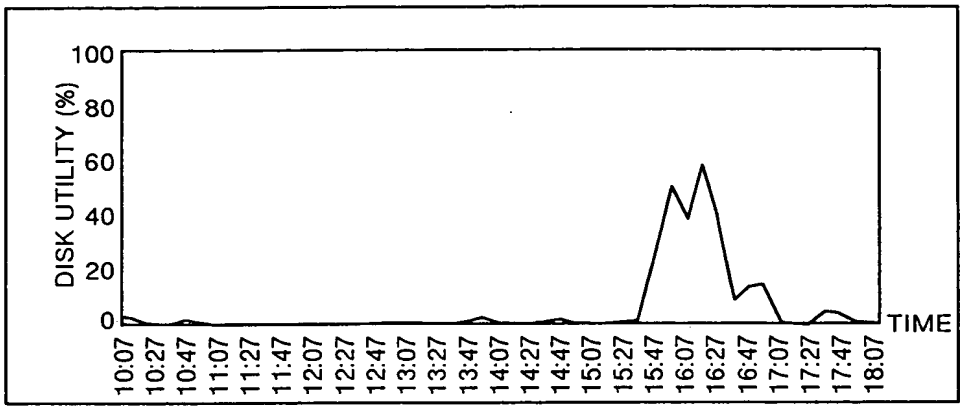

DISK UTILITY (%)
100
80
60
40
20
0
TIME
10:07
10:27
10:47
11:07
11:27
11:47
12:07
12:27
12:47
13:07
13:27
13:47
14:07
14:27
14:47
15:07
15:27
15:47
16:07
16:27
16:47
17:07
17:27
17:47
18:07

FIG.3B

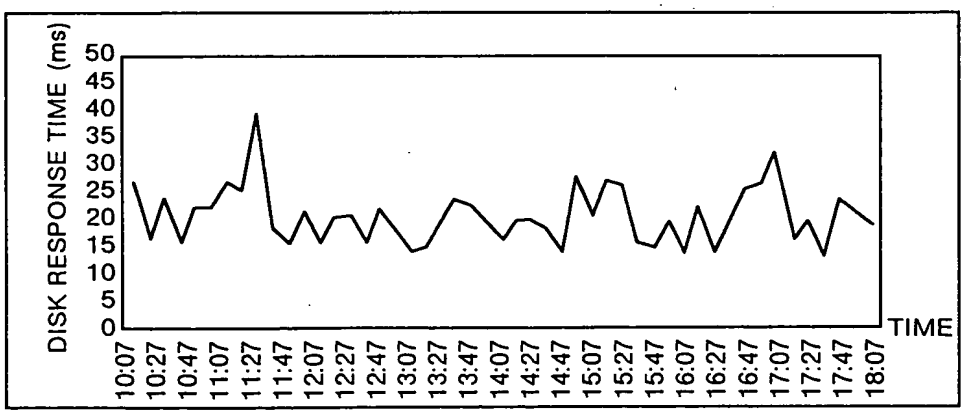
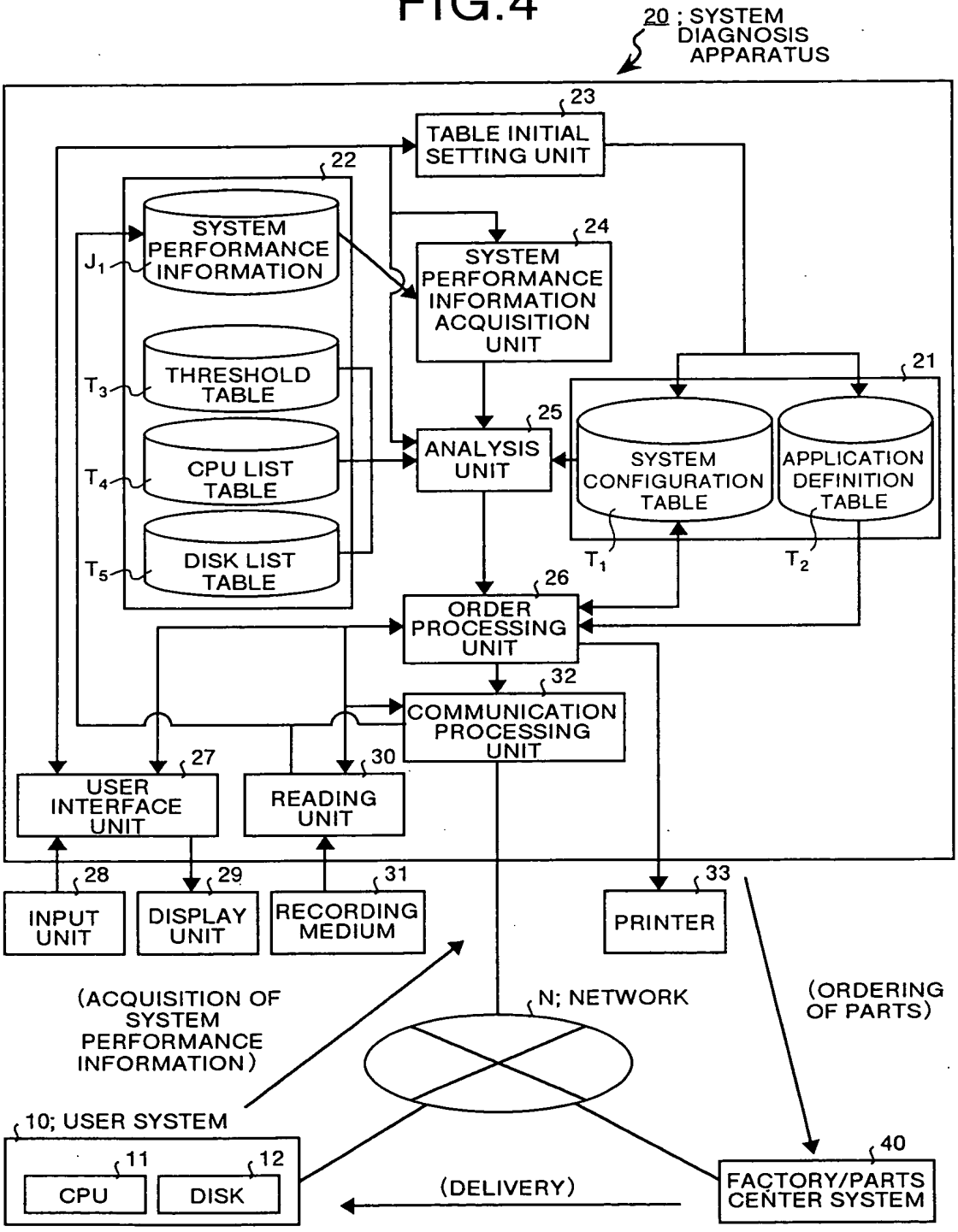

DISK RESPONSE TIME (ms)
50
45
40
35
30
25
20
15
10
5
0
TIME
10:07
10:27
10:47
11:07
11:27
11:47
12:07
12:27
12:47
13:07
13:27
13:47
14:07
14:27
14:47
15:07
15:27
15:47
16:07
16:27
16:47
17:07
17:27
17:47
18:07

FIG.4


20 ; SYSTEM DIAGNOSIS APPARATUS
23
TABLE INITIAL SETTING UNIT
22
SYSTEM PERFORMANCE INFORMATION
J1
24
SYSTEM PERFORMANCE INFORMATION ACQUISITION UNIT
THRESHOLD TABLE
T3
21
CPU LIST TABLE
T4
25
ANALYSIS UNIT
SYSTEM CONFIGURATION TABLE
APPLICATION DEFINITION TABLE
DISK LIST TABLE
T5
T1
T2
26
ORDER PROCESSING UNIT
32
COMMUNICATION PROCESSING UNIT
27
30
USER INTERFACE UNIT
READING UNIT
28
29
31
33
INPUT UNIT
DISPLAY UNIT
RECORDING MEDIUM
PRINTER
(ACQUISITION OF SYSTEM PERFORMANCE INFORMATION)
N; NETWORK
(ORDERING OF PARTS)
10; USER SYSTEM
40
11
12
CPU
DISK
(DELIVERY)
FACTORY/PARTS CENTER SYSTEM

# FIG.5

$J_1$;SYSTEM PERFORMANCE INFORMATION

| | CPU UTILITY RATE (%) | EXECUTION QUEUE FOR CPU (PCS) | DISK UTILITY RATE (%) | DEMAND QUEUE FOR DISK | DISK RESPONSE TIME (ms) |
|---|---|---|---|---|---|
| 10:00:00 | 30 | 0 | 10 | 3 | 30 |
| 10:10:00 | 35 | 0 | 80 | 5 | 67 |
| 10:20:00 | 30 | 0 | 77 | 8 | 70 |
| 10:30:00 | 84 | 3 | 30 | 1 | 34 |
| 10:40:00 | 90 | 4 | 30 | 0 | 20 |
| 10:50:00 | 97 | 6 | 22 | 1 | 19 |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 12:00:00 | 93 | 7 | 13 | 0 | 22 |
| 12:10:00 | 70 | 4 | 8 | 0 | 33 |
| AVERAGE | 84 | 3 | 43 | 1 | 32 |

CPU PERFORMANCE INFORMATION

DISK PERFORMANCE INFORMATION

# FIG.6

$T_1$:SYSTEM CONFIGURATION TABLE

| MACHINE ID | MOUNTED CPU INFORMATION | | | | MOUNTED DISK INFORMATION | | | APPLICATION INFORMATION | CPU UPGRADE RECOMMEND INFORMATION | | DISK UPGRADE RECOMMEND INFORMATION | | CPU ORDER INFORMATION | | DISK ORDER INFORMATION | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NO. OF MOUNTABLE CPUS | CPU MODEL NAME | CPU PERFORMANCE (CLOCK FREQUENCY, MHZ) | NO. OF CPUS MOUNTED | DISK MODEL NAME | DISK PERFORMANCE (ROTATING SPEED,RPM) | NO. OF DISKS MOUNTED | | CPU MODEL NAME | NO.OF CPUS | DISK MODEL NAME | NO.OF DISKS | CPU MODEL NAME | NO.OF CPUS ORDERED | DISK MODEL NAME | NO.OF DISKS ORDERED |
| A | 2 | SPII | 233 | 1 | SG2 | 5500 | 1 | MAIL SERVER | | | SG2 | 2 | | | SG2 | 1 |
| B | 4 | PTT | 200 | 2 | AL2 | 7200 | 3 | PRINTER SERVER | PTT | 3 | | | PTT | 1 | | |
| C | 2 | ZZ2 | 400 | 2 | SGS | 10000 | 5 | JOB SERVER | ZZ3 | 2 | SGS | 7 | ZZ3 | 2 | SGS | 2 |
| D | 1 | AM2 | 133 | 1 | SG1 | 4500 | 2 | PERSONAL TERMINAL | PTT | 1 | AL2 | 1 | | | | |

FIG.7A

$T_2$; APPLICATION DEFENITION TABLE

| APPLICATION INFORMATION | UPGRADING FLAG |
|---|---|
| MAIL SERVER | 1 |
| PRINTER SERVER | 1 |
| FTP SERVER | 0 |
| JOB SERVER | 1 |
| PERSONAL TERMINAL | 0 |

FIG.7B

$T_3$; THRESHOLD TABLE

| No. | RESOURCE | PARAMETER | THRESHOLD |
|---|---|---|---|
| 1 | CPU | CPU UTILITY RATE | a (%) |
| 2 | CPU | LENGTH OF EXECUTION QUEUE FOR CPU | b (PCS) |
| 3 | DISK | DISK UTILITY RATE | x (%) |
| 4 | DISK | LENGTH OF DEMAND QUEUE FOR DISK | y (PCS) |
| 5 | DISK | DISK RESPONSE TIME | z (ms) |

FIG.7C

$T_4$; CPU LIST TABLE

| No. | CPU MODEL NAME | CPU PERFORMANCE (CLOCK FREQUENCY, MHz) |
|---|---|---|
| 1 | AM2 | 133 |
| 2 | PTT | 200 |
| 3 | SPII | 233 |
| 4 | ZZ1 | 300 |
| 5 | ZZ2 | 400 |
| 6 | ZZ3 | 500 |

FIG.7D

$T_5$; DISK LIST TABLE

| No. | DISK MODEL NAME | DISK PERFORMANCE (ROTATING SPEED,RPM) |
|---|---|---|
| 1 | SG1 | 4500 |
| 2 | SG2 | 5500 |
| 3 | AL2 | 7200 |
| 4 | SGS | 10000 |

FIG.8

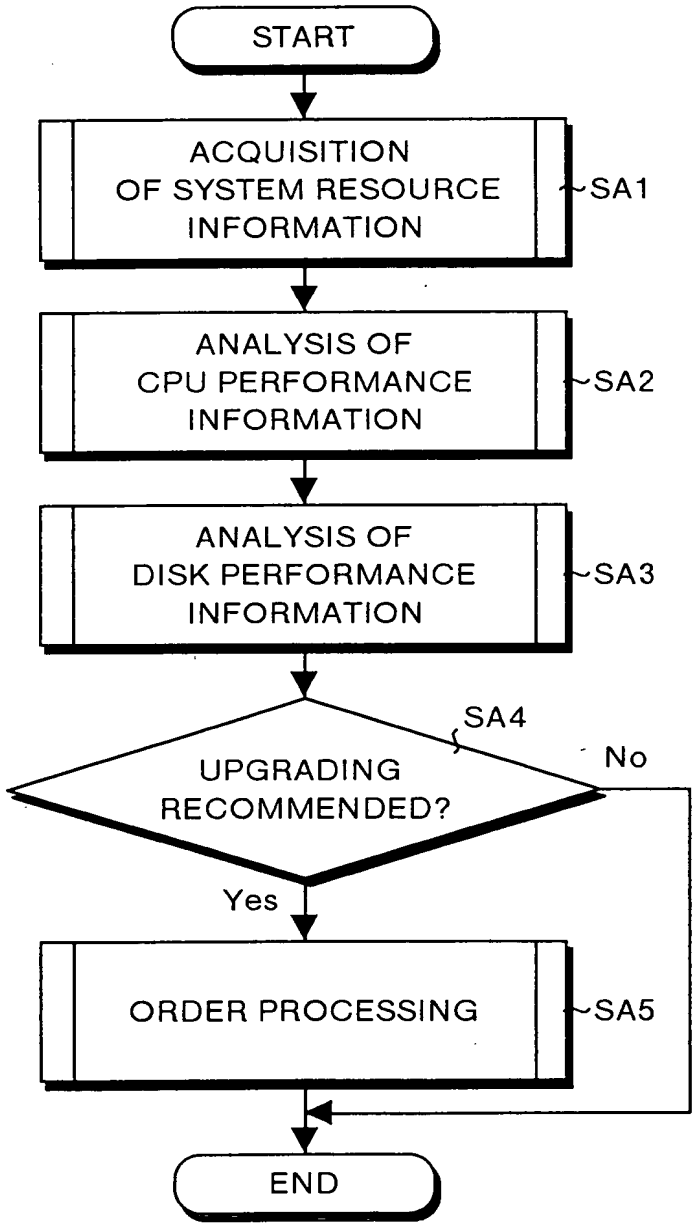
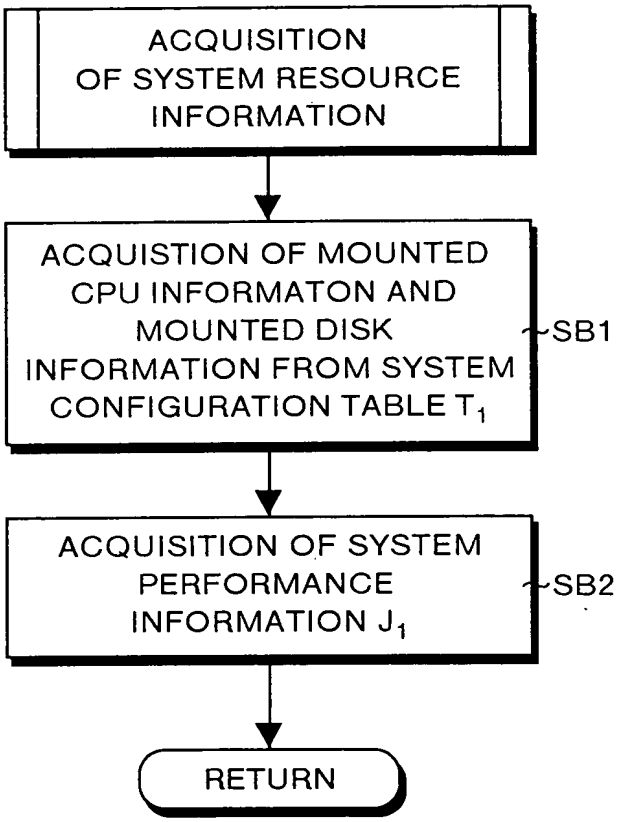

START
ACQUISITION OF SYSTEM RESOURCE INFORMATION
SA1
ANALYSIS OF CPU PERFORMANCE INFORMATION
SA2
ANALYSIS OF DISK PERFORMANCE INFORMATION
SA3
SA4
UPGRADING RECOMMENDED?
No
Yes
ORDER PROCESSING
SA5
END

FIG.9


ACQUISITION OF SYSTEM RESOURCE INFORMATION
ACQUISTION OF MOUNTED CPU INFORMATON AND MOUNTED DISK INFORMATION FROM SYSTEM CONFIGURATION TABLE $T_1$
SB1
ACQUISITION OF SYSTEM PERFORMANCE INFORMATION $J_1$
SB2
RETURN

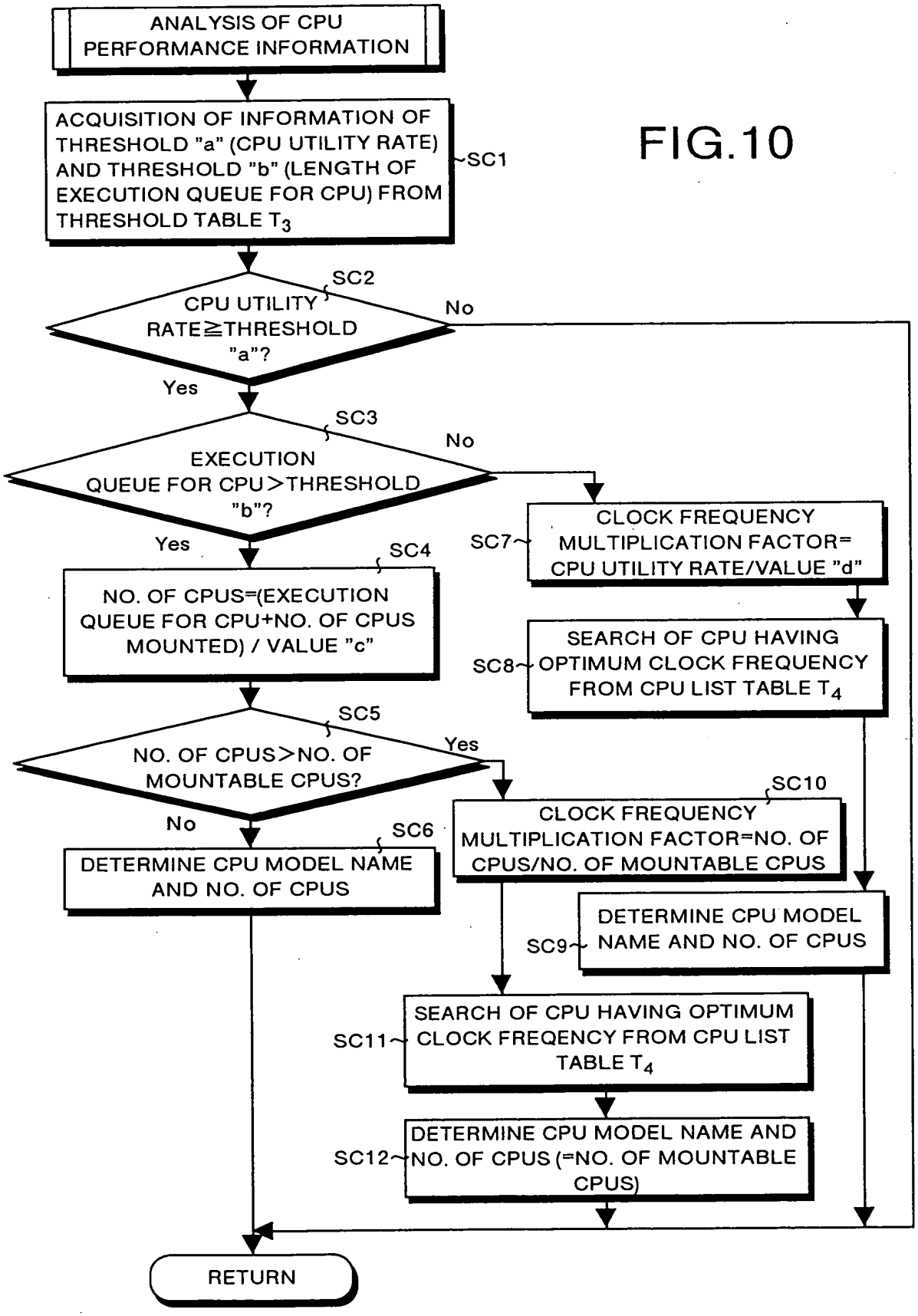



FIG.10

EP 0 945 803 A2

FIG.11

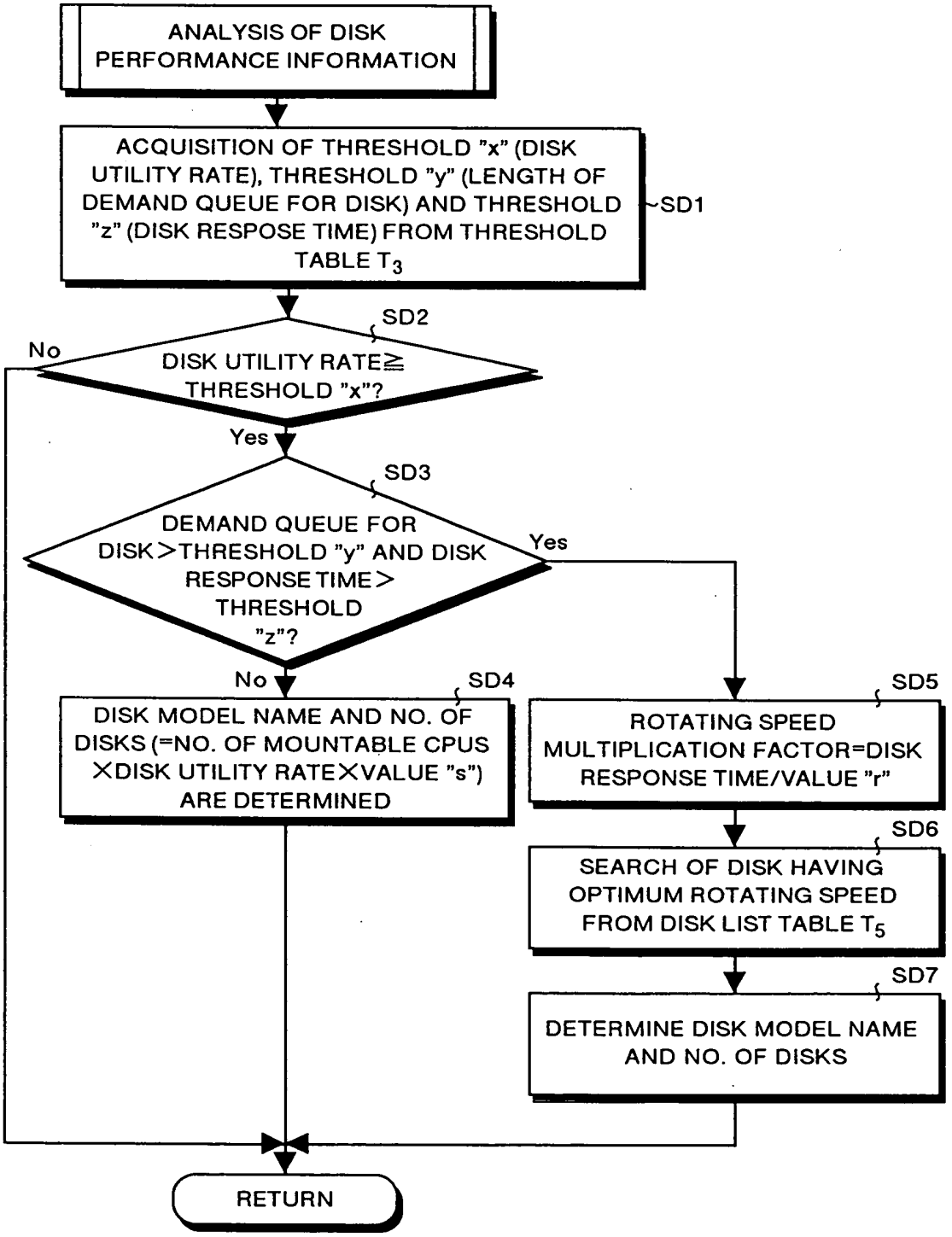
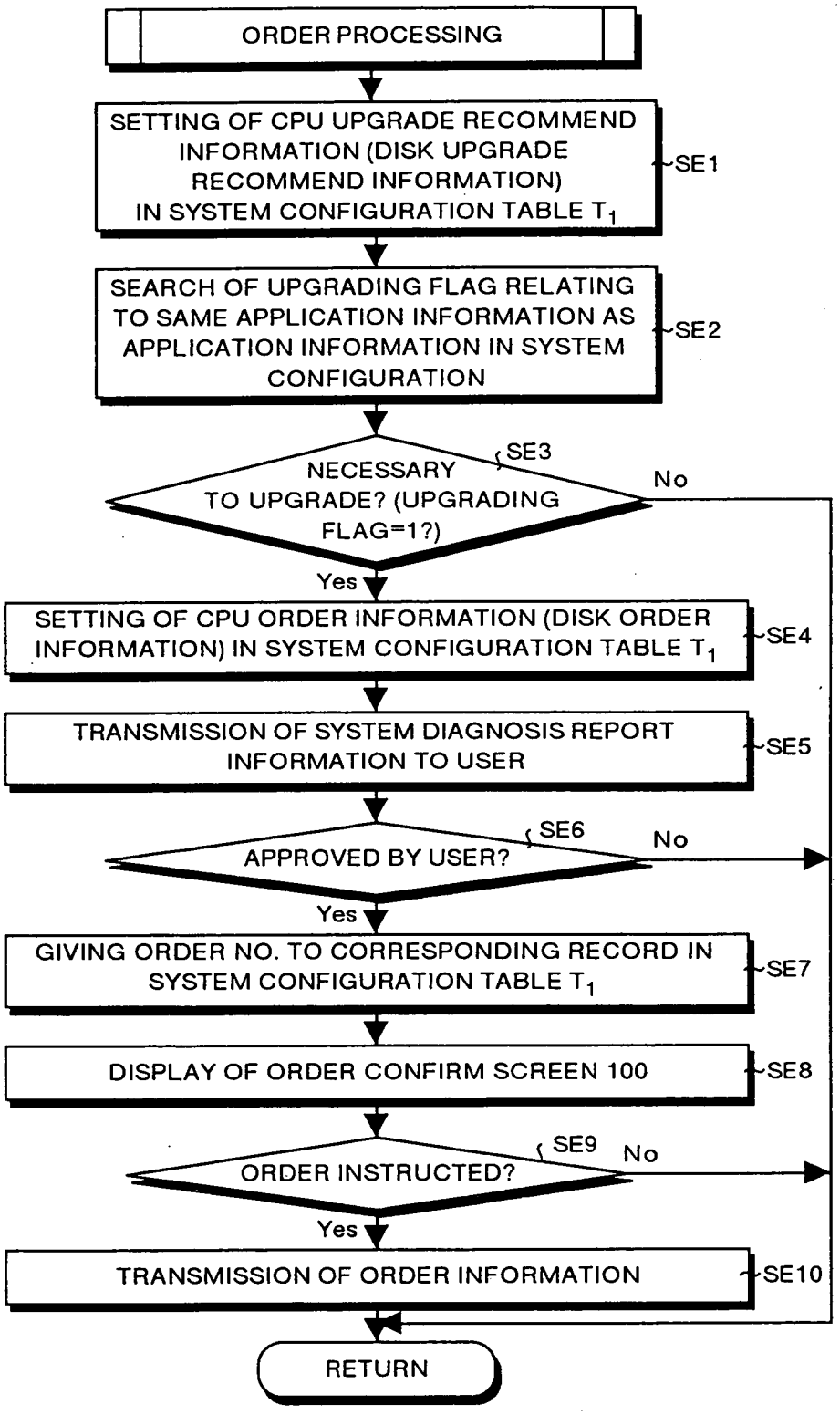

ANALYSIS OF DISK PERFORMANCE INFORMATION
ACQUISITION OF THRESHOLD "x" (DISK UTILITY RATE), THRESHOLD "y" (LENGTH OF DEMAND QUEUE FOR DISK) AND THRESHOLD "z" (DISK RESPOSE TIME) FROM THRESHOLD TABLE $T_3$
SD1
SD2
DISK UTILITY RATE≧ THRESHOLD "x"?
No
Yes
SD3
DEMAND QUEUE FOR DISK>THRESHOLD "y" AND DISK RESPONSE TIME> THRESHOLD "z"?
Yes
No
SD4
DISK MODEL NAME AND NO. OF DISKS (=NO. OF MOUNTABLE CPUS ×DISK UTILITY RATE×VALUE "s") ARE DETERMINED
SD5
ROTATING SPEED MULTIPLICATION FACTOR=DISK RESPONSE TIME/VALUE "r"
SD6
SEARCH OF DISK HAVING OPTIMUM ROTATING SPEED FROM DISK LIST TABLE $T_5$
SD7
DETERMINE DISK MODEL NAME AND NO. OF DISKS
RETURN

FIG.12




0949605 0260100

# FIG.13

TO ABC COMPANY

PAGE (1/3)

JUNE 25, 1999
F COMPANY

## SYSTEM DIAGNOSIS REPORT

### 1. SYSTEM DIAGNOSIS SUBJECT

CUSTOMER NAME:

ABC COMPANY

DATA OF DIAGNOSIS:

JUNE 16, 1999; THURSDAY, 9:57 TO 18:07

HARDWARE

| | |
|---|---|
| COMPUTER NAME | GPSVR |
| MODEL NAME | DEF OF F COMPANY |
| CPU | ZZ2 400MHz×2 |
| MEMORY | 64MB |
| DISK | 5 UNITS |
| NETWORK | 100BASE-TX |

SOFTWARE

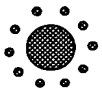
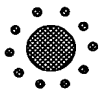
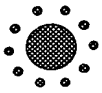
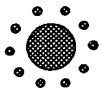
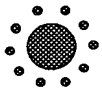
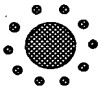
| | |
|---|---|
| OS | GHI |

0949059 - 020500

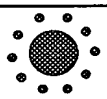
# FIG.14

PAGE (2/3)

2. SYSTEM DIAGNOSIS RESULT

| RESOURCE | JUNE 16 MORNING 08:00~12:00 | AFTERNOON 12:00~18:00 | EVENING 18:00~24:00 | NIGHT 00:00~08:00 | MORNING 08:00~12:00 |
|---|---|---|---|---|---|
| CPU |  | | — | — | — |
| MEMORY |  |  | — | — | — |
| DISK |  | | — | — | — |
| NETWORK |  |  | — | — | — |

【LEGEND】

| MARK | MEANING |
|---|---|
|  | NO PROBLEM IN PERFORMANCE. CONTINUE TO USE AS USUAL. |
| | NEEDS CONTINUED DIAGNOSIS. CARE IS NEEDED WHEN EXPANDING BUSINESS.. |
| | PROBLEM FOUND IN PERFORMANCE. CONFORM TO TUNING ADVICE. |
| — | NO DATA SAMPLED THIS TIME. |

# FIG.15

PAGE (3/3)

3. PROBLEM AND TUNING ADVICE

| RESOURCE | PROBLEM | TUNING ADVICE |
|---|---|---|
| CPU | INCREASED CPU UTILITY RATE. | RECOMMEND TO INCREASE CLOCK SPEED OF CPU. CHANGE FROM PRESENT 400MHz×2 TO 500MHz×2. |
| MEMORY | ☺ | ☺ |
| DISK | DISK LOAD INCREASED DUE TO PAGING. | DISK LOAD CAN BE REDUCED BY ADDING TWO DISKS. |
| NETWORK | ☺ | ☺ |

【LEGEND】

| MARK | MEANING |
|---|---|
| ☺ | NO PROBLEM. |
| — | NOT DIAGNOSED THIS TIME. |

FOR INQUIRY ABOUT REPORT,CONTACT:
F COMPANY
PERSON IN CHARGE :
YOSHIMURA OR NOMURA
TELEPHONE : XXX−XXX−XXXX

0543063-020200

# FIG.16

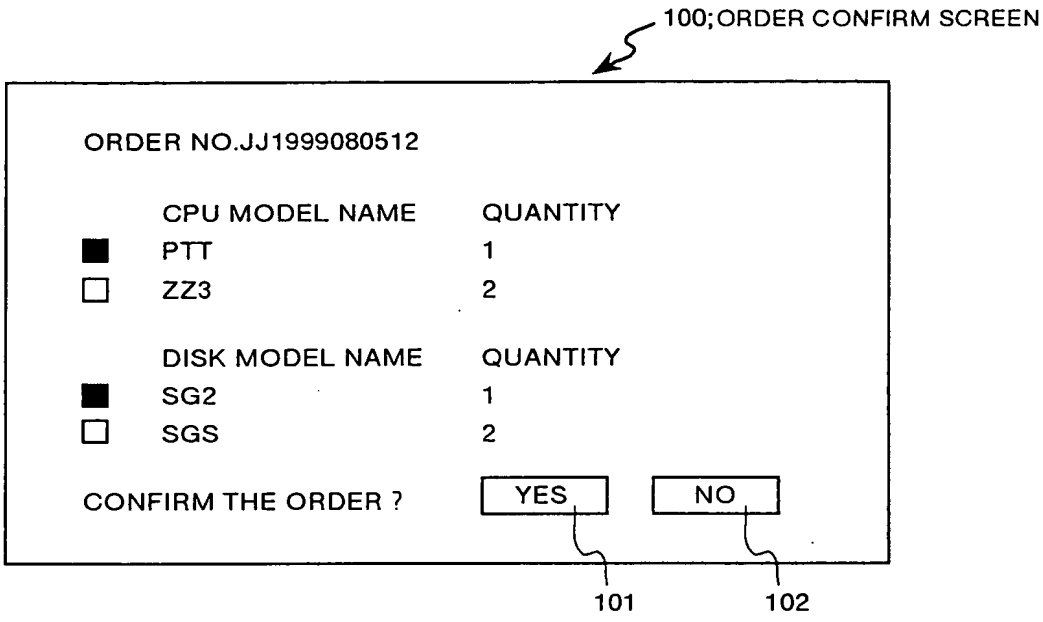
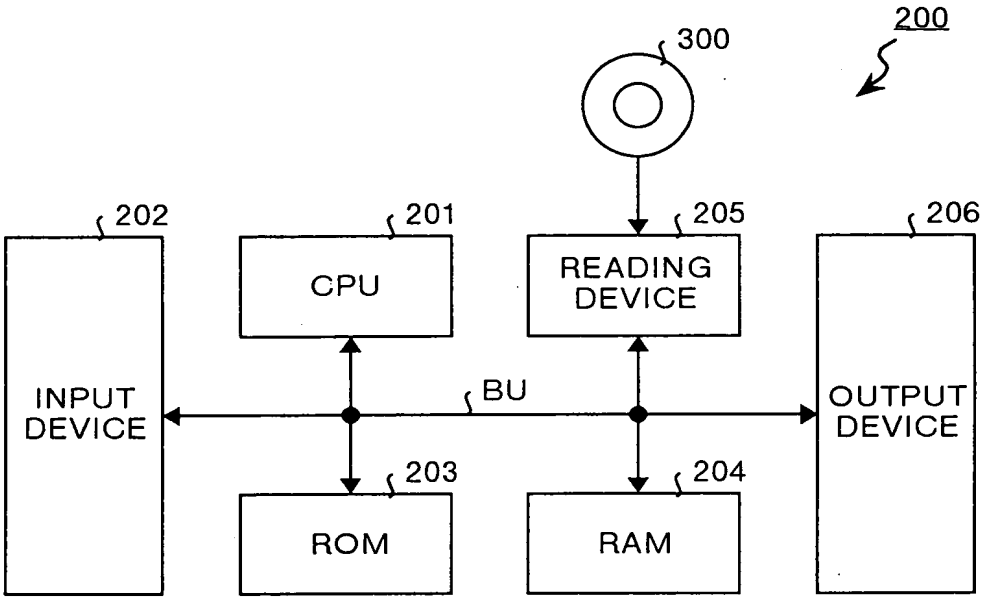

100;ORDER CONFIRM SCREEN
ORDER NO.JJ1999080512
CPU MODEL NAME
QUANTITY
PTT
1
ZZ3
2
DISK MODEL NAME
QUANTITY
SG2
1
SGS
2
CONFIRM THE ORDER ?
YES
NO
101
102

FIG.17


200
300
202
201
205
206
CPU
READING DEVICE
INPUT DEVICE
BU
OUTPUT DEVICE
203
204
ROM
RAM